Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] electromagnetic propulsion devices comprising:
a barrel;
a cavity therein which extends the length of the barrel with a breach end opening at one end, and a muzzle end opening at the other end, and which throughout its length has uniform right cross section profiles to its central axis;
two barrel rails that are: each a barrel power rail, of equal length, oriented parallel the barrel cavity central axis, located in the wall of the barrel cavity, located along the same length of the barrel, and electrically insulated from each other and other electrically conductive elements within the barrel cavity wall;
each said barrel power rail has a continuous surface its length that is part of the barrel cavity surface and said rail surface extends the length of the barrel cavity through which an armature is propelled in the device, and each barrel power rail has a connection means at its breach end for attachment of circuitry from an outside power source;
a wall conductor assembly comprised of:
a barrel bus that is:

located outside of the barrel cavity, and electrically insulated from direct electrical continuity with barrel rails and the located along the same length of the barrel as the power rails and a plurality of wall conductors that are:

oriented orthogonal the barrel cavity, parallel to one another and separated from one another in distribution along the length of the barrel cavity and each said wall conductor is:

a continuous insulated conductor between it ends, located in the barrel cavity wall and therein between its ends includes a coil oriented orthogonal the barrel cavity which circumscribes the barrel cavity one or more times at or very near the barrel cavity surface except where shaped to avoid physical and electrical continuity with barrel rails at the cavity surface,

and one end of each said wall conductor is physically and electrically continuous with the barrel bus and each said wall conductor has at its end distal the barrel bus an electrical contact means at the barrel cavity through a mating opening in the barrel cavity surface and each wall conductor is electrically insulated from its surroundings beyond the barrel bus except at its electrical contact means;

armatures which are:

in or for insertion into the breach end of the barrel cav-

ity, for propulsion through the barrel cavity towards and out of the muzzle end of the barrel cavity,
and the central axis of each said armature when in the barrel cavity is very close or coincident with the barrel cavity central axis, and all right section armature profiles are smaller then all barrel cavity right section profiles, and a portion of said profiles of an armature in the barrel cavity are at armature surface circumscribing the armature axis and proximal the barrel cavity surface and thereat are similar to the barrel cavity right section profiles in shape and slightly undersized thereof to permit unobstructed traverse of the barrel cavity by the armature;
each armature has a forward current shunt that is located in the armature surface near the muzzle end of the armature and is electrically insulated from all other electrically conducting elements in the armature;
the forward current shunt of an armature in the barrel cavity has:
surface with continuous electrical continuity with the cavity surface of the power rail that is proximal said shunt and with armature movement said continuity is continuous sliding electrical continuity,
and surface that is proximal the cavity surface at the wall conductor assembly forward wall conductor contact means and said shunt surface has continuous electrical

continuity with said contact means at the cavity location of said surface and with armature movement said continuity is continuous sliding electrical continuity;
the forward current shunt of an armature in the barrel cavity maintains:
continuous electrical continuity between the shunt proximal barrel power rail and the wall conductor assembly via its continuous electrical continuity with the barrel cavity surface of said power rail and its continuous electrical continuity with forward wall conductor contact means of the wall conductor assembly;
the forward current shunt of an armature traversing the barrel cavity has continuous sliding electrical continuity with the wall conductor assembly from breach to muzzle resultant the continuous sliding electrical continuity its shunt surface at the wall conductor contact means has sequentially with successive wall conductors comprising forward wall conductor of the wall conductor assembly and said continuity is via forward wall conductor contact means as said contact means pass across said surface with continuous sliding electrical continuity as said surface passes said contact means barrel cavity location;
the forward current shunt of an armature traversing the barrel cavity maintains continuous sliding electrical continuity between the shunt proximal barrel power rail via its barrel cavity surface and the wall conductor assembly

via its continuous sequential sliding electrical continuity with successive wall conductors comprising forward wall conductor of the wall conductor assembly via forward wall conductor contact means as said contact means pass across said shunt with continuous sliding electrical continuity as said shunt passes said contact means barrel cavity location;

each armature has an aft current shunt that is located in the armature surface near the breach end of the armature and is electrically insulated from all other electrically conducting elements in the armature;

the aft current shunt of an armature in the barrel cavity has:

surface with continuous electrical continuity with the cavity surface of the power rail that is proximal said shunt and with armature movement said continuity is continuous sliding electrical continuity,

and surface that is proximal the cavity surface at the wall conductor assembly aft wall conductor contact means and said shunt surface has continuous electrical continuity with said contact means at the cavity location of said surface and with armature movement said continuity is continuous sliding electrical continuity;

the aft current shunt of an armature in the barrel cavity maintains:

continuous electrical continuity between the shunt prox-

imal barrel power rail and the wall conductor assembly via its continuous electrical continuity with the barrel cavity surface of said power rail and its continuous electrical continuity with aft wall conductor contact means of the wall conductor assembly;

the aft current shunt of an armature traversing the barrel cavity has continuous sliding electrical continuity with the wall conductor assembly from breach to muzzle resultant the continuous sliding electrical continuity its shunt surface at the wall conductor contact means has sequentially with successive wall conductors comprising aft wall conductor of the wall conductor assembly and said continuity is via aft wall conductor contact means as said contact means pass across said surface with continuous sliding electrical continuity as said surface passes said contact means barrel cavity location;

the aft current shunt of an armature traversing the barrel cavity maintains continuous sliding electrical continuity between the shunt proximal barrel power rail via its barrel cavity surface and the wall conductor assembly via its continuous sequential sliding electrical continuity with successive wall conductors comprising aft wall conductor of the wall conductor assembly via aft wall conductor contact means as said contact means pass across said shunt with continuous sliding electrical continuity as said shunt passes said contact means barrel cavity location;

each said armature has a permanent magnet within it that is polarized in the armature axis direction and the permanent magnet center is located proximal the armature center in the armature axis direction;
and which has with an appropriate outside power source connected to the power rails and an armature for the device in or inserted into the breach end of the barrel cavity where said power rails and wall assembly are extant, the electric current path in the device effecting electromagnetic propulsion of the armature in the barrel cavity toward the muzzle extant and remaining so while the armature is completely in the barrel cavity where said rails and wall assembly are extant and said electromagnetic propulsion results from:
the magnetic fields of the electric currents in forward wall conductor interacting with the magnetic field of the armature permanent magnet creating therewith and there between apparent forces of attraction that have barrel cavity axis parallel muzzle directed components and the magnetic fields of the electric currents in aft wall conductor interacting with the magnetic field of the armature permanent magnet creating therewith and there between apparent forces of repulsion that have barrel cavity axis parallel muzzle directed components and said apparent forces of attraction and repulsion propel said armature in the barrel cavity towards the muzzle.

[c2] A electromagnetic propulsion device as in 1 used as a reversible electric motor wherein the armature has power takeoff means and armature travel is limited to the barrel cavity where the barrel and armature elements which effect armature propulsion are extant and reversing the polarity of the barrel power rails reverses the direction of armature propulsion in the barrel cavity,
and the muzzle end of the barrel and the cavity therein becomes the breach end of the barrel and the cavity therein,
the breach end of the barrel and the cavity therein becomes the muzzle end of the barrel and the cavity therein,
the muzzle end of an armature becomes the breach end of the armature,
the breach end of an armature becomes the muzzle end of the armature,
the forward current shunt of the armature becomes the aft current shunt of the armature,
and the aft current shunt of the armature becomes the forward current shunt of the armature.

[c3] electromagnetic propulsion device comprising:
a barrel;
a cavity therein which extends the length of the barrel with a breach end opening at one end, and a muzzle end

opening at the other end, and which throughout its length has uniform right cross section profiles to its central axis;
two pairs of barrel rails not both the same;
each barrel rail is a barrel power rail,
and said barrel rails are:
of equal length, oriented parallel the barrel cavity central axis, located in the wall of the barrel cavity, located along the same length of the barrel, and electrically insulated from each other and other electrically conductive elements within the barrel cavity wall;
each said barrel power rail has a continuous surface its length that is part of the barrel cavity surface and said rail surface extends the length of the barrel cavity through which an armature is propelled in the device;
each barrel power rail has a connection means at its breach end for attachment of circuitry from an outside power source;
a wall conductor assembly comprised of:
a barrel bus that is:
located outside of the barrel cavity, electrically insulated from direct electrical continuity with barrel rails and the length of said barrel bus is similar the length of said barrel power rails and the location of said barrel bus along the length of the barrel is similar the location of the power rails;

a plurality of wall conductors that are:
of equal length, a continuous insulated conductor, oriented orthogonal the barrel cavity, parallel to one another and separated from one another in distribution along the length of the barrel bus;
each said wall conductor is located in the barrel cavity wall and therein between its ends circumscribes or circumscribes in part the barrel cavity at or very near the barrel cavity surface except where shaped to avoid physical and electrical continuity with barrel rails at the cavity surface and one or more said wall conductor between its ends includes a coil oriented orthogonal the barrel cavity that circumscribes the barrel cavity one or more times, and one end of each wall conductor is physically and electrically continuous with the barrel bus and at its end distal the barrel bus each wall conductor has an electrical contact means at the barrel cavity through a mating opening in the barrel cavity surface and each said wall conductor is electrically insulated from its surroundings beyond the barrel bus except at its electrical contact means;
armatures which are:
in or for insertion into the breach end of the barrel cavity, for propulsion through the barrel cavity towards and out of the muzzle end of the barrel cavity,
and the central axis of each said armature when in the

barrel cavity is very close or coincident with the barrel cavity central axis,
and all right section armature profiles are smaller then all barrel cavity right section profiles, and a portion of said armature profiles of an armature in the barrel cavity are at surface circumscribing the armature axis while proximal the barrel cavity surface and thereat are similar to the barrel cavity right section profiles in shape and slightly undersized thereof to permit unobstructed traverse of the barrel cavity by the armature;
each armature has a forward current shunt that is located in the armature surface near the muzzle end of the armature and is electrically insulated from all other electrically conducting elements in the armature;
the forward current shunt of an armature in the barrel cavity has:
surface with continuous electrical continuity with the cavity surface of the power rail that is proximal said shunt and with armature movement said continuity is continuous sliding electrical continuity,
and surface that is proximal the cavity surface at the wall conductor assembly forward wall conductor contact means and said shunt surface has continuous electrical continuity with said contact means at the cavity location of said surface and with armature movement said continuity is continuous sliding electrical continuity;

the forward current shunt of an armature in the barrel cavity maintains:

continuous electrical continuity between the shunt proximal barrel power rail and the wall conductor assembly via its continuous electrical continuity with the barrel cavity surface of said power rail and its continuous electrical continuity with forward wall conductor contact means of the wall conductor assembly;

the forward current shunt of an armature traversing the barrel cavity has continuous sliding electrical continuity with the wall conductor assembly from breach to muzzle resultant the continuous sliding electrical continuity its shunt surface at the wall conductor contact means has sequentially with successive wall conductors comprising forward wall conductor of the wall conductor assembly and said continuity is via forward wall conductor contact means as said contact means pass across said surface with continuous sliding electrical continuity as said surface passes said contact means barrel cavity location;

the forward current shunt of an armature traversing the barrel cavity maintains continuous sliding electrical continuity between the shunt proximal barrel power rail via its barrel cavity surface and the wall conductor assembly via its continuous sequential sliding electrical continuity with successive wall conductors comprising forward wall conductor of the wall conductor assembly via forward

wall conductor contact means as said contact means pass across said shunt with continuous sliding electrical continuity as said shunt passes said contact means barrel cavity location;

each armature has an aft current shunt that is located in the armature surface near the breach end of the armature and is electrically insulated from all other electrically conducting elements in the armature;

the aft current shunt of an armature in the barrel cavity has:

surface with continuous electrical continuity with the cavity surface of the power rail that is proximal said shunt and with armature movement said continuity is continuous sliding electrical continuity,

and surface that is proximal the cavity surface at the wall conductor assembly aft wall conductor contact means and said shunt surface has continuous electrical continuity with said contact means at the cavity location of said surface and with armature movement said continuity is continuous sliding electrical continuity;

the aft current shunt of an armature in the barrel cavity maintains:

continuous electrical continuity between the shunt proximal barrel power rail and the wall conductor assembly via its continuous electrical continuity with the barrel cavity surface of said power rail and its continuous elec-

trical continuity with aft wall conductor contact means of the wall conductor assembly;

the aft current shunt of an armature traversing the barrel cavity has continuous sliding electrical continuity with the wall conductor assembly from breach to muzzle resultant the continuous sliding electrical continuity its shunt surface at the wall conductor contact means has sequentially with successive wall conductors comprising aft wall conductor of the wall conductor assembly and said continuity is via aft wall conductor contact means as said contact means pass across said surface with continuous sliding electrical continuity as said surface passes said contact means barrel cavity location;

the aft current shunt of an armature traversing the barrel cavity maintains continuous sliding electrical continuity between the shunt proximal barrel power rail via its barrel cavity surface and the wall conductor assembly via its continuous sequential sliding electrical continuity with successive wall conductors comprising aft wall conductor of the wall conductor assembly via aft wall conductor contact means as said contact means pass across said shunt with continuous sliding electrical continuity as said shunt passes said contact means barrel cavity location;

each armature has a propulsion bus that is:

a continuous insulated conductor between its ends, located froward the aft current shunt and aft the forward

current shunt in the armature axis direction, located in the armature surface where right section area profiles are like the barrel cavity right section profiles but slightly undersized thereof , located within the armature, in, at or proximal the armature surface throughout its extent, and oriented orthogonal the armature axis;

said propulsion bus between its ends circumscribes the armature axis and includes a coil oriented orthogonal the armature axis which circumscribes the armature axis one or more times;

the propulsion bus of an armature in the barrel cavity is oriented therein to travel in close proximity to the wall conductors of the wall conductor assembly, and to carry current in a direction:

perpendicular to the cavity axis, parallel wall conductors and perpendicular to armature direction of barrel cavity traverse;

the propulsion bus of an armature in the barrel cavity has proximal one end surface with continuous electrical continuity with the cavity surface of the barrel power rail not at the forward current shunt and has proximal its second end surface with continuous electrical continuity with the cavity surface of a barrel power rail not at the forward current shunt and without other electrical continuities with its cavity surface,

the propulsion bus continuous electrical continuities with

the barrel power rails are continuous sliding electrical continuity with armature movement in the barrel cavity;
the armature propulsion bus, except at its surfaces at the barrel power rails is insulated from direct electrical continuity with other conducting elements of the device;
which has with an appropriate outside power source connected to each pair of power rails and an armature for the device in or inserted into the breach end of the barrel cavity where said power rails and wall assembly are extant,
the electric current path in the device effecting electromagnetic propulsion of the armature in the barrel cavity toward the muzzle extant and remaining so while the armature is completely in the barrel cavity where said rails and wall assembly are extant and said electromagnetic propulsion results from the magnetic fields of the electric currents in forward wall conductor and aft wall conductor of the wall conductor assembly interacting with the electric current in the propulsion bus creating therein forces with barrel cavity axis parallel, barrel muzzle directed components which propel said armature in the barrel cavity towards the muzzle.

[c4] A combination as in 3 but wherein the two pairs of barrel power rails not both the same, are four separate barrel power rails.

[c5] An electromagnetic propulsion device as in 3 used as a reversible electric motor wherein the armature has power takeoff means and armature travel is limited to the barrel cavity where the barrel and armature elements which effect armature propulsion are extant and reversing the polarity of a pair of barrel power rails reverses the direction of armature propulsion in the barrel cavity, and the muzzle end of the barrel and the cavity therein becomes the breach end of the barrel and the cavity therein,
the breach end of the barrel and the cavity therein becomes the muzzle end of the barrel and the cavity therein,
the muzzle end of an armature becomes the breach end of the armature,
the breach end of an armature becomes the muzzle end of the armature,
the forward current shunt of the armature becomes the aft current shunt of the armature,
and the aft current shunt of the armature becomes the forward current shunt of the armature.

[c6] A electromagnetic propulsion device as in 4 used as a reversible electric motor wherein the armature has power takeoff means and armature travel is limited to the barrel cavity where the barrel and armature elements which effect armature propulsion are extant and reversing the

polarity of a pair of barrel power rails reverses the direction of armature propulsion in the barrel cavity, and the muzzle end of the barrel and the cavity therein becomes the breach end of the barrel and the cavity therein,

the breach end of the barrel and the cavity therein becomes the muzzle end of the barrel and the cavity therein,

the muzzle end of an armature becomes the breach end of the armature,

the breach end of an armature becomes the muzzle end of the armature,

the forward current shunt of the armature becomes the aft current shunt of the armature,

and the aft current shunt of the armature becomes the forward current shunt of the armature.

[c7] A device as in 3 wherein however said barrel cavity has a twist so that consecutive right sections through the barrel has a constant distance rate of angular rotation about the cavity axis and the consecutive right sections through the armature share the same constant distance rate of angular rotation about the armature axis and said twist imparts rotation to armatures traversing the barrel cavity.

[c8] A device as in 4 wherein however said barrel cavity has a twist so that consecutive right sections through the bar-

rel has a constant distance rate of angular rotation about the cavity axis and the consecutive right sections through the armature share the same constant distance rate of angular rotation about the armature axis and said twist imparts rotation to armatures traversing the barrel cavity.

[c9] A device as in 5 wherein however said barrel cavity has a twist so that consecutive right sections through the barrel has a constant distance rate of angular rotation about the cavity axis and the consecutive right sections through the armature share the same constant distance rate of angular rotation about the armature axis and said twist imparts rotation to armatures traversing the barrel cavity.

[c10] A device as in 6 wherein;
however, said barrel cavity has a twist so that consecutive right sections through the barrel has a constant distance rate of angular rotation about the cavity axis and the consecutive right sections through the armature share the same constant distance rate of angular rotation about the armature axis and
said twist imparts rotation to armatures traversing the barrel cavity.

[c11] an electromagnetic propulsion device comprising:

a barrel;
a cavity therein which extends the length of the barrel with a breach end opening at one end, and a muzzle end opening at the other end, and which throughout its length has uniform right cross section profiles to its central axis;
two barrel rails that are:
each a barrel power rail, of equal length, oriented parallel the barrel cavity central axis, located in the wall of the barrel cavity, located along the same length of the barrel, and electrically insulated from each other and other electrically conductive elements within the barrel cavity wall;
each said barrel power rail has a continuous surface its length that is part of the barrel cavity surface and said rail surface extends the length of the barrel cavity through which an armature is propelled in the device, and each barrel power rail has a connection means at its breach end for attachment of circuitry from an outside power source;
a wall conductor assembly comprised of:
a barrel bus that is:
located outside of the barrel cavity, electrically insulated from direct electrical continuity with barrel rails and the length of said barrel bus is similar the length of said barrel power rails and the location of said barrel bus

along the length of the barrel is similar the power rails location;

a plurality of wall conductors that are:

of equal length, oriented orthogonal the barrel cavity, parallel to one another and separated from one another in distribution along the length of the barrel bus;

each said wall conductor is located in the barrel cavity wall and therein between its ends circumscribes or circumscribes in part the barrel cavity at or very near the barrel cavity surface except where shaped to avoid physical and electrical continuity with barrel rails at the cavity surface, and one or more said wall conductor between its ends includes a coil oriented orthogonal the barrel cavity that circumscribes the barrel cavity one or more times,

one end of each wall conductor is physically and electrically continuous with the barrel bus and at its end distal the barrel bus each wall conductor has an electrical contact means at the barrel cavity through a mating opening in the barrel cavity surface and

each said wall conductor is electrically insulated from its surroundings beyond the barrel bus except at its electrical contact means;

armatures which are:

in or for insertion into the breach end of the barrel cavity, for propulsion through the barrel cavity towards and out of the muzzle end of the barrel cavity,

and the central axis of each said armature when in the barrel cavity is very close or coincident with the barrel cavity central axis, and all right section armature profiles are smaller then all barrel cavity right section profiles, and a portion of said armature profiles of an armature in the barrel cavity are at surface circumscribing the armature axis while proximal the barrel cavity surface and thereat are similar to the barrel cavity right section profiles in shape and slightly undersized thereof to permit unobstructed traverse of the barrel cavity the armature;
each armature has a forward current shunt that is located in the armature surface near the muzzle end of the armature and is electrically insulated from all other electrically conducting elements in the armature;
the forward current shunt of an armature in the barrel cavity has:
surface with continuous electrical continuity with the cavity surface of the power rail that is proximal said shunt and with armature movement said continuity is continuous sliding electrical continuity,
and surface that is proximal the cavity surface at the wall conductor assembly forward wall conductor contact means and said shunt surface has continuous electrical continuity with said contact means at the cavity location of said surface and with armature movement said continuity is continuous sliding electrical continuity;

the forward current shunt of an armature in the barrel cavity maintains:

continuous electrical continuity between the shunt proximal barrel power rail and the wall conductor assembly via its continuous electrical continuity with the barrel cavity surface of said power rail and its continuous electrical continuity with forward wall conductor contact means of the wall conductor assembly;

the forward current shunt of an armature traversing the barrel cavity has continuous sliding electrical continuity with the wall conductor assembly from breach to muzzle resultant the continuous sliding electrical continuity its shunt surface at the wall conductor contact means has sequentially with successive wall conductors comprising forward wall conductor of the wall conductor assembly and said continuity is via forward wall conductor contact means as said contact means pass across said surface with continuous sliding electrical continuity as said surface passes said contact means barrel cavity location;

the forward current shunt of an armature traversing the barrel cavity maintains continuous sliding electrical continuity between the shunt proximal barrel power rail via its barrel cavity surface and

the wall conductor assembly via its continuous sequential sliding electrical continuity with successive wall conductors comprising forward wall conductor of the wall

conductor assembly via forward wall conductor contact means as said contact means pass across said shunt with continuous sliding electrical continuity as said shunt passes said contact means barrel cavity location;
an aft current shunt that is located in the armature surface near the breach end of the armature and
the aft current shunt of an armature in the barrel cavity has surface that is proximal the cavity surface at the wall conductor assembly aft wall conductor contact means and said shunt surface has continuous electrical continuity with said contact means at the cavity location of said surface and with armature movement said continuity is continuous sliding electrical continuity;
the aft current shunt of an armature traversing the barrel cavity has continuous sliding electrical continuity with the wall conductor assembly from breach to muzzle resultant the continuous sliding electrical continuity its shunt surface at the wall conductor contact means has sequentially with successive wall conductors comprising aft wall conductor of the wall conductor assembly and said continuity is via aft wall conductor contact means as said contact means pass across said surface with continuous sliding electrical continuity as said surface passes said contact means barrel cavity location;
each armature has a propulsion bus that is:
a continuous insulated conductor between its ends, lo-

cated froward the aft current shunt and aft the forward current shunt in the armature axis direction, located in the armature surface where right section area profiles are like the barrel cavity right section profiles but slightly undersized thereof , located within the armature, in, at or proximal the armature surface throughout its extent, and oriented orthogonal the armature axis;

said propulsion bus between its ends circumscribes the armature axis and includes a coil oriented orthogonal the armature axis which circumscribes the armature axis one or more times;

the propulsion bus of an armature in the barrel cavity is oriented therein to: travel in close proximity to the wall conductors of the wall conductor assembly, carry current in a direction: perpendicular to the cavity axis, parallel to the wall conductors and perpendicular to armature direction of barrel cavity traverse;

the propulsion bus of an armature in the barrel cavity has proximal one end continuous electrical continuity with the cavity surface of the barrel power rail not at the forward current shunt and with armature movement in the barrel cavity said continuity is continuous sliding electrical continuity;

each armature has a propulsion bus-aft shunt circuit means that provides continuous electrical continuity between the propulsion bus and the aft current shunt at

the propulsion bus end proximal the aft current shunt;
the propulsion bus-aft shunt means in the device is a short current bus in the armature connecting and providing continuous electrical continuity between the aft current shunt and the end of the propulsion bus proximal the aft current shunt and the propulsion bus-aft shunt means with exception the above electrical continuities is electrically insulated from direct continuity with other conducting elements of the device;
the armature propulsion bus, except at its surface at the barrel power rail and its continuous electrical continuity with the propulsion bus-aft shunt circuit means is insulated from direct electrical continuity with other conducting elements of the device;
the aft current shunt of an armature in the barrel cavity maintains:
continuous electrical continuity between the propulsion bus and the wall conductor assembly and said continuity is with the propulsion bus via the propulsion bus-aft shunt circuit means and with the wall conductor assembly via its continuous electrical continuity with aft wall conductor contact means of said assembly;
the aft current shunt of an armature traversing the barrel cavity maintains continuous electrical continuity between the propulsion bus and the wall conductor assembly and the continuous electrical continuity said shunt has with

the propulsion bus is via the said propulsion bus-aft shunt circuit means and the continuous sliding electrical continuity said shunt has with the wall conductor assembly is via the continuous sequential sliding electrical continuity the shunt has with successive wall conductors comprising aft wall conductor of the wall conductor assembly via their contact means as said contact means pass across said shunt with continuous sliding electrical continuity as said shunt passes said contact means barrel cavity location;

the aft current shunt of an armature in the barrel cavity is electrically insulated from other conducting elements of the device except for the continuous electrical continuity of said shunt with the propulsion bus-aft shunt circuit means and the continuous electrical continuity of said shunt with the wall conductor assembly aft wall conductor contact means;

which has with an appropriate outside power source connected to the power rails and an armature for the device in or inserted into the breach end of the barrel cavity where said power rails and wall assembly are extant, the electric current path in the device effecting electromagnetic propulsion of the armature in the barrel cavity toward the muzzle extant and remains so while the armature is completely in the barrel cavity where said rails and wall assembly are extant and

said electromagnetic propulsion results from the magnetic fields of the electric currents in forward wall conductor and aft wall conductor of the wall conductor assembly interacting with the electric current in the propulsion bus creating therein forces with barrel cavity axis parallel,
barrel muzzle directed components which propel said armature in the barrel cavity towards the muzzle.

[c12] A device as in 11 but wherein, with an armature in the barrel cavity, the propulsion bus-aft shunt circuit means is comprised of :
a third barrel rail which is located parallel to the two barrel power rails, is electrically insulated therefrom, and is of like or similar length and location along the barrel cavity length as said power rails and has continuous barrel cavity surface its length,
surface on the aft current shunt which has continuous electrical continuity with said third barrel rail and during armature movement in the barrel cavity said shunt surface has continuous sliding electrical continuity with the barrel cavity surface of the third barrel rail,
and surface on said propulsion bus which has continuous electric continuity with the barrel cavity surface of the third rail and during armature movement in the barrel cavity said propulsion bus surface has continuous

sliding electrical continuity with the barrel cavity surface of said additional barrel rail.

[c13] A device as in 11 wherein; A device as in 11 wherein however said barrel cavity has a twist so that consecutive right sections through the barrel has a constant distance rate of angular rotation about the cavity axis and the consecutive right sections through the armature share the same constant distance rate of angular rotation about the armature axis and said twist imparts rotation to armatures traversing the barrel cavity.

[c14] A device as in 12 wherein;
A device as in 12 wherein however said barrel cavity has a twist so that consecutive right sections through the barrel has a constant distance rate of angular rotation about the cavity axis and the consecutive right sections through the armature share the same constant distance rate of angular rotation about the armature axis and said twist imparts rotation to armatures traversing the barrel cavity.